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**REMARKS**

**I. Status of the Claims**

Claims 1-74, 157, and 158 were examined in the application. Claims 75-156, 159, and 160 have been withdrawn from consideration. Claim 36 has been amended to recite a "pretreatment composition for lanthionizing keratin fibers," to render it consistent with the preamble of the dependent claims. Based on the preamble of the dependent claims, it can be seen that this error was clerical in nature, and it is believed that this amendment does not narrow the claim scope. No new matter has been added.

Applicants respectfully request that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner, placing the pending claims in condition for allowance.

Applicants submit that the proposed amendment of claim 36 does not raise new issues or necessitate the undertaking of any additional search of the art by the Examiner, since all of the elements and their relationships claimed were either earlier claimed or inherent in the claims as examined. Therefore, this Amendment should allow for immediate action by the Examiner.

**II. Claim Rejection under 35 U.S.C. § 102**

Claims 1-5, 9-15, 17-24, 26-32, 34-40, 44-50, 52-59, 61-67, 69-73, 157, and 158 remain rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,223,252 ("Kolc") for the reasons of record and for the additional reasons set forth by the Examiner at pp. 2-3 of the Office Action. Applicants respectfully traverse this rejection.

FINNEGAN  
HENDERSON  
FARABOW  
GARRETT &  
DUNNER LLP

1300 I Street, NW  
Washington, DC 20005  
202.408.4000  
Fax 202.408.4400  
www.finnegan.com

A rejection under § 102 is only proper when the claimed subject matter is identically described or disclosed in the prior art. *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972); see also M.P.E.P. § 706.02(a) ("For anticipation under 35 U.S.C. § 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly."). Importantly, each and every element of a claim must be set forth in the prior art reference for there to be anticipation. See M.P.E.P. § 2131.

The Examiner asserts that composition 3 of Kolc at col. 9 shows a composition comprising at least one organic nucleophile and at least one hydroxide ion generator. *Office Action* at pp. 2-3.

Applicants respectfully disagree that Kolc anticipates the present claims. Composition 3 of Kolc is not a composition for lanthionizing keratin fibers, as required by independent claims 1 and 36 (amended). Composition 3 contains ammonium hydroxide in an amount to provide a pH of 7.5. This pH level, however, is not sufficient to lanthionize hair. To support this position, Applicants submit pages from "Milady's Hair Structure and Chemistry Simplified," pp. 191-192 ("Schoon"). Schoon teaches that chemical relaxers cause the disulfide bonds in the hair to be broken. *Schoon* at p. 192. In the presence of "highly alkaline product," a new type of cross-link bond is formed involving a single sulfur atom. *Id.* This process is termed lanthionization. *Id.* Chemical hair relaxing agents that can cause lanthionization include sodium hydroxide (lye), and no-lye agents such as potassium hydroxide, lithium hydroxide, and guanidine carbonate. *Schoon* at p. 191. All of these reagents afford pH levels between 12 and 13.5. *Id.* Sodium hydroxide can sometimes provide pH levels of greater than 13.5. *Id.* Although some relaxers can be used at pH levels between 6.5 and 8.5, such as sodium

FINNEGAN  
HENDERSON  
FARABOW  
GARRETT &  
DUNNER LLP

1300 I Street, NW  
Washington, DC 20005  
202.408.4000  
Fax 202.408.4400  
www.finnegan.com

bisulfite, these relaxers "are less effective in straightening hair, especially resistant hair."

*Id.*

In contrast, Kolc's processes occur at lower pH where the disulfide bonds are broken and the sulfur atoms of the hair re-form new cross-linked di-sulfide bonds. *Kolc* at col. 1, lines 31-35. This is what typically happens when hair is subjected to a permanent wave composition as in, and is not the same as lanthionization. *Id.*

Consistent with these principles, Kolc states that the pH of the compositions range from about 7.5 to 9.5. *Id.* at col. 4, lines 62-63.

From the teachings of Schoon, Applicants respectfully submit that a composition containing ammonium hydroxide having a pH of 7.5 is not sufficient to cause lanthionization. Moreover, Kolc explicitly states that its compositions are used for "permanently reshaping or curling human hair," which is not lanthionization. *Kolc* at col. 1, lines 9-12. Because Kolc's composition 3 is not a composition for lanthionizing keratin fibers, as claimed, Kolc does not anticipate the present claims.

Accordingly, Applicants respectfully request withdrawal of this rejection.

### III. Claim Rejection under 35 U.S.C. § 103

Claims 6-8, 16, 25, 41-43, 51, 60, 68, and 74 remain rejected under 35 U.S.C. § 103(a) as being unpatentable over Kolc in view of U.S. Patent No. 5,753,215 ("Mougin") for reasons of record and the additional reasons set forth by the Examiner at page 3 of the Office Action. Applicants respectfully traverse this rejection.

The Examiner supports the combination of references by stating that "both references are in the same art of hair cosmetic compositions that [are] used for waving

or reshaping the hair as taught by Kolc ... and also used for styling or shaping hair as taught by Mougin ... wherein the compositions comprise similar ingredients such as organic nucleophiles ... and sodium hydroxide and potassium hydroxide as a hydroxide ion generator as taught by Mougin. *Id.* at p. 3.

In order to establish a *prima facie* case of obviousness, the Examiner must demonstrate that there is some suggestion or motivation, either in the cited references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine reference teachings. See M.P.E.P. § 2143. Moreover, all claim limitations must be taught or suggested. M.P.E.P. § 2143.03. Neither requirement has been met here.

Applicants respectfully submit that the combination of references is improper. Applicants disagree that Kolc and Mougin teach similar compositions. Kolc describes permanent wave reducing compositions including a cysteine reducing agent and a monothioglycolate. *Kolc* at col. 4, lines 31-43. As discussed above, Kolc does not describe compositions for lanthionizing keratin fibers. Mougin, however, does not remedy this deficiency. Mougin is directed to compositions having "excellent remanence properties " comprising pseudo-latexes. *Mougin* at col. 1, lines 24-27. Specifically, the pseudo-latex consist of "particles of a film-forming radical polymer containing carboxylic acid functions neutralized to a degree of neutralization between 10 and 80% using a polyfunctional neutralizing agent." *Id.* at col. 1, lines 50-60. Mougin's cosmetic compositions can take the form of "shampoo, conditioner, a styling or treatment lotion or gel or a hair shaping product, or alternatively in the form of a make-up product such as a mascara or a nail varnish." *Id.* at col. 1, lines 9-13. Only in one

FINNEGAN  
HENDERSON  
FARABOW  
GARRETT &  
DUNNER LLP

1300 I Street, NW  
Washington, DC 20005  
202.408.4000  
Fax 202.408.4400  
www.finnegan.com

instance does Mougin suggest that the cosmetic composition can take the form of "permanent wave or hair straightening compositions." *Id.* at col. 6, lines 48-49.

Applicants respectfully submit that the mere presence of a small overlap of "similar ingredients" between the references is not sufficient to combine reference teachings, particularly in view of the very different purposes of the Kolc and Mougin compositions and the large number of non-overlapping disclosed ingredients in both references. One of ordinary skill in the art would need hindsight to pick and choose among the vast number of ingredients to arrive at the claimed invention.

Moreover, even if for the sake of argument, the references could be combined, Applicants respectfully submit that the combined teachings would not result in the claimed invention. As discussed above, Kolc does not teach or suggest a lanthionizing composition, and Mougin's brief reference to hair straightening compositions is not sufficient to suggest lanthionizing compositions, particularly, when, as discussed above, lanthionization requires such high pH levels, which are not even suggested in Mougin. If anything, Mougin teaches away from high pH levels by stating that the "cosmetic compositions according to the invention generally have a pH approximately between 7 and 7.2." *Mougin* at col. 6, lines 43-44. Moreover, each of Mougin's 29 examples is directed to compositions other than lanthionizing compositions, such as creams, shampoos, mascaras, a nail varnish, lotions, and hair gels. Mougin provides no specific guidance to arrive at the claimed ingredients and achieve a sufficient pH, as taught by Schoon, to arrive at the claimed lanthionizing composition.

FINNEGAN  
HENDERSON  
FARABOW  
GARRETT &  
DUNNER LLP

1300 I Street, NW  
Washington, DC 20005  
202.408.4000  
Fax 202.408.4400  
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Applicants thus respectfully submit that a *prima facie* case of obviousness has not been established. Accordingly, Applicants respectfully request that the rejection be withdrawn.

**IV. Conclusion**

In view of the foregoing remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

By: Maria Bautista  
Maria T. Bautista  
Reg. No. 52,516

Date: February 5, 2004

FINNEGAN  
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used to adjust the thio to a pH level between 9 and 10. The alkaline solution swells and opens the cuticle, allowing penetration into the cortex.

**Caution:** A thioglycolate relaxer product is incompatible with sodium hydroxide. Never use a thio-based relaxer on hair that has previously been relaxed with a sodium hydroxide product, or hair breakage may occur!

### Sodium Hydroxide

Sodium hydroxide is commonly used in chemical relaxing products and is a very effective hair straightener. Sodium hydroxide is also known as "lye" or "caustic soda". The pH level of this product often exceeds 12 and is sometimes above 13.5! As this high pH level suggests, this is a highly corrosive chemical. The hair can swell to three times its normal diameter. Use this relaxer with care and caution.

**Caution:** A sodium hydroxide relaxer product is incompatible with thioglycolate. Never use a sodium hydroxide product on hair that has been previously relaxed with a thioglycolate product, or hair breakage may occur!

### Low pH Reducers

Some reducing agents work fairly well at pH levels between 6.5 and 8.5. Sodium bisulfite is an example of a low pH value reducing agent. Low pH level relaxers are less effective in straightening hair, especially resistant hair. However, they are milder on the scalp and hair. These relaxers are recommended for thin or overly brittle hair. Low pH relaxers are also useful as pre-relaxer treatments for excessively curly hair.

### Other Alkaline Reducers

Besides sodium hydroxide, other high alkaline substances are also used as relaxers. Potassium hydroxide, lithium hydroxide, and guanidine carbonate (no-lye straighteners) are used in a great many relaxer preparations. All of these have pH levels between 12 and 13.5, which makes them highly corrosive chemicals that can swell the hair to three times its normal diameter.

Use these relaxing agents with great care and caution. If used incorrectly, they cause serious scalp and skin burns. They may even accidentally dissolve the hair. These same chemicals are used in depilatory creams. They are capable of solubilizing (dissolving) hair.

These chemicals are highly corrosive to the skin and eyes. Always wear safety glasses and gloves when mixing, measuring, pouring, or dispensing the substances. Take precautions to protect clients, as well. Offer them eye protection. Safety goggles may look funny, but there is nothing funny about endangering a client's vision.

As discussed in previous chapters, the rate of a chemical reaction doubles with each 10°F rise in temperature. Therefore, using heat to speed up the relaxing process can be dangerous. The corrosive action on skin will speed up, as well. Never use heat unless specified in the manufacturer's instructions.

Products containing these materials come with a base or no-base formula. The base is a petroleum cream designed to protect the scalp from damage. Milder no-base formulas are available, too. These products are less irritating to the scalp but the same safety warnings apply.

Use extreme caution with all types of relaxers. Always keep these products from contacting a client's skin, i.e., ears, forehead, and neck. Applying protective cream to these areas is advisable even with no-base products.

These relaxers cause other types of chemical reactions to occur in the hair. Like reducers, the disulfide bonds are broken and reformed, but a different type of cross-link is created.

Normally, the two sulphur atoms on adjacent polypeptide chains join to create a disulfide cross-link bond. Highly alkaline products, such as those mentioned above, create a new type of cross-link bond. Instead of two sulphur atoms forming a bridge, a single sulphur cross-link bond forms. This is called **lanthionization**. The new type of bond is called a **lanthionine cross-link**.

High percentages of lanthionine cross-link bonds in the hair are undesirable. They leave hair less flexible and increase brittleness. Lanthionization also interferes with permanent wave procedures. Hair straightened by reducers and fixed with oxidizers will hold a permanent wave. Reducer/oxidizer methods creates a low percentage of lanthionine cross-link bonds. Permanent wave reducers cannot break lanthionine cross-link bonds. Therefore, sodium and potassium hydroxide type relaxers leave the hair in a condition that cannot be waved (Fig. 14.3).

### Neutralization

After the thio has remained in the hair a sufficient period of time to properly straighten the hair, the neutralizer (fixative) is applied. The fixative compound (an oxidizer) is thoroughly applied to completely penetrate into the cortex and stop the action of the thio compound. It really has two major functions:

1. It prevents further bond-breaking action of the thio solution and neutralizes (to a degree) the alkalinity.
2. It reforms the broken disulfide bonds in their new position in order to hold the hair in its newly straightened position.

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